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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/907,182	08/06/97	YAMAZAKI S	07977/023002

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EXAMINER	
DIAMOND,A	
ART UNIT	**PAPER NUMBER**
1753	8

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 08/907,182	Applicant(s) Yamazaki et al.
	Examiner Alan Diamond	Group Art Unit 1753

☒ Responsive to communication(s) filed on *Oct 25, 1999*.

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire *three* month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) *26-76, 78, 79, and 81-102* is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) *26-76, 78, 79, and 81-102* is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐approved ☐disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☒ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☒ received in Application No. (Series Code/Serial Number) *08/623,336*.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

Comments

1. Upon reconsideration, the Examiner withdraws the requirement for the substitute specification. The grammar and idiomatic English are fine.

2. The objections to the claims because of informalities has been overcome by applicants' amendment of the claims other than the objections which are indicated below.

3. The Examiner withdraws the 35 USC 112, first paragraph, new matter rejection with respect the term "an insulating surface". The silicon oxide substrate disclosed by applicants in the specification (page 9, line 15) is one of many well known insulating substrates that are used in the semiconductor art. There is no reason to limit applicants only to silicon oxide. With respect to the 35 USC 112, first paragraph, new matter rejection of the term "semiconductor device" in the preamble of the claims, it is acknowledged that applicants have removed "semiconductor" from said term. The examiner accepts this change. Upon reconsideration, the Examiner withdraws said new matter rejection concerning the term "semiconductor device" since the applicants should not be limited to a solar cell or photoelectric conversion device. There are many other devices which can be manufactured using the claimed process steps. The remainder of the 35 USC 112, first paragraph, rejections for new matter have either been overcome by applicants' amendment of the claims, or have been maintained and are set forth below.

4. The 35 USC 112, second paragraph, rejections of the claim have been overcome by applicants' amendment other than those which are provided below.

5. The 35 USC 102 and 103 and obviousness-type double patenting rejections based upon Yamazaki et al (U.S. Patent 5,789,284) and Zhang et al (U.S. Patent 5,529,937) are now moot in view of the fact that all of the instant independent claims recite phosphorus. Yamazaki et al uses amorphous silicon for gettering, whereas Zhang et al uses a silicon oxide film for gettering.

6. The 35 USC 102(b) rejection of claim 76 and its dependent claims over JP 6-333824 has been overcome by applicants' amendment of claim 76 so as to recite "forming a gettering layer in contact with the said semiconductor film, said gettering layer including phosphorus". The phospho-silicate glass layer (99) of JP 6-333824 is not in contact with the silicon film (104). There is a foundation film (102), i.e., a silicon oxide film, between the phospho-silicate glass layer and the silicon film (see all of the Figure of JP 6-333824.

Claim Objections

7. Claims 26, 34, 76, 81-85, 89-95, and 100-102 are objected to because of the following informalities: In claim 26, at line 5, the term "catalyst metal containing" should be changed to "catalyst metal-containing". In claim 34, at line 10, the word "functions" should be changed to "function". In claim 76, at line 13, the term "metal containing" should be changed to "metal-containing". In claim 81, at line 4, the term "metal containing" should be changed to "metal-containing". In claim 81, at line 8, the word "functions" should be changed to "function". In claim 82, at line 4, the term "metal containing" should be changed to "metal-containing". In claim 82, at line 8, the word "functions" should be changed to "function". In claim 83, at line 8, the

word "functions" should be changed to "function". In claim 84, at line 4, the term "metal containing" should be changed to "metal-containing". In claim 84, at line 8, the word "functions" should be changed to "function". In claim 85, at line 3, the term "metal containing" should be changed to "metal-containing". In claim 85, at line 7, the word "functions" should be changed to "function". In claim 89, at each of lines 4, 9, and 10, the term "metal containing" should be changed to "metal-containing". At line 2 in each of claims 90-95, 100 and 102, it is requested that the word "and" be changed to "or" since MPEP 608.01(n) seems to prefer the use of the word "or" when reciting "any one of" language for multiple dependent claims. Likewise, it is requested that "and" at line 1 of claim 101 be changed to "or". Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claims 26-33, 51-58, and 90-95 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claim 26, at line 14, the temperature range "not lower than 500°C" is not supported by the specification as originally filed. The same applies to dependent claims 27-33 and 90-95.

In claim 31, the temperature range "not higher than 800°C" is not supported by the specification as originally filed.

In claim 51, at line 13, the temperature range "not lower than 500°C" is not supported by the specification as originally filed. The same applies to dependent claims 52-58 and 90-95.

In claim 56, the temperature range "not higher than 800°C" is not supported by the specification as originally filed.

Applicants argue that the specification discloses the temperature "500°C to 800°C" on page 22, line 19. However, this argument is not deemed to be persuasive because the temperature range "500°C to 800°C" is not sufficient support for the ranges "not lower than 500°C" and "not higher than 800°C". Note In re Wertheim, 541 USPQ F.d. 257, 191 USPQ 90 (CCPA 1976), where there was a disclosed range of 25-60, and examples at 36 and 50. The range 35-60 was supported. However, the range "at least 35" was new matter.

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claims 28, 31, 36, 41, 44, 50, 53, 56, 61, 66, 69, 75, 76, 78, 79, 87-100, and 102 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 28 is indefinite because it is not clear which heating in claim 26 is being referred to by the term "said heating" at lines 1-2 in claim 28. Note that claim 26 recites a heating for the crystallization step and also a heating to getter.

Claim 31 is indefinite because it is not clear which heating in claim 26 is being referred to by the term "said heating" at lines 1-2 in claim 31. Note that claim 26 recites a heating for the crystallization step and also a heating to getter.

Claim 36 is indefinite because it is not clear which heating in claim 34 is being referred to by the term "said heating" at lines 1-2 in claim 36. Note that claim 34 recites a heating for the crystallization step and also a heating to getter.

Claim 41 is indefinite because it is not clear which heating in claim 34 is being referred to by the term "said heating" at lines 1-2 in claim 41. Note that claim 34 recites a heating for the crystallization step and also a heating to getter.

Claim 44 is indefinite because it is not clear which heating in claim 42 is being referred to by the term "said heating" at lines 1-2 in claim 44. Note that claim 42 recites a heating for the crystallization step and also a heating to getter.

Claim 50 is indefinite because it is not clear which heating in claim 42 is being referred to by the term "said heating" at lines 1-2 in claim 50. Note that claim 42 recites a heating for the crystallization step and also a heating to getter.

Claim 53 is indefinite because it is not clear which heating in claim 51 is being referred to by the term "said heating" at lines 1-2 in claim 53. Note that claim 51 recites a heating for the crystallization step and also a heating to getter.

Claim 56 is indefinite because it is not clear which heating in claim 51 is being referred to by the term "said heating" at lines 1-2 in claim 56. Note that claim 51 recites a heating for the crystallization step and also a heating to getter.

Claim 61 is indefinite because it is not clear which heating in claim 59 is being referred to by the term "said heating" at lines 1-2 in claim 61. Note that claim 59 recites a heating for the crystallization step and also a heating to getter.

Claim 66 is indefinite because it is not clear which heating in claim 59 is being referred to by the term "said heating" at lines 1-2 in claim 66. Note that claim 59 recites a heating for the crystallization step and also a heating to getter.

Claim 69 is indefinite because it is not clear which heating in claim 67 is being referred to by the term "said heating" at lines 1-2 in claim 69. Note that claim 67 recites a heating for the crystallization step and also a heating to getter.

Claim 75 is indefinite because it is not clear which heating in claim 67 is being referred to by the term "said heating" at lines 1-2 in claim 75. Note that claim 67 recites a heating for the crystallization step and also a heating to getter.

Claim 76 is indefinite because it is not clear exactly where the catalyst metal-containing at line 5 material is formed. It is not clear exactly where the "forming" step at line 5 occurs. The

same applies to dependent claims 78, 79, and 90-95. Accordingly, it is suggested that in claim 76, at line 5, the term "on said semiconductor film" be inserted after "material" so as to point out where the catalyst metal-containing material is formed.

Claim 76 is confusing because the language "reduce a concentration of said catalyst metal" at the last two lines is subjective and indefinite. The concentration is reduced with respect to what? The same applies to dependent claims 78, 79, and 90-95.

In claim 76, at the second-to-last line, the term "a concentration" should be changed to "the concentration" so as to particularly point out the concentration which is intended. The same applies to dependent claims 78, 79, and 90-95.

Claim 87 is indefinite because "said gettering layer" at line 13 lacks positive antecedent support within the claim itself. The same applies to dependent claims 90-100 and 102.

Claim 88 is indefinite because "said gettering layer" at each of lines 11 and 13 lacks positive antecedent support within the claim itself. The same applies to dependent claims 90-100 and 102.

Claim 89 is indefinite because it is not clear exactly where the metal-containing material at line 4 is formed. It is not clear exactly where the "forming" step at line 4 occurs. The same applies to dependent claims 90-100 and 102. Accordingly, it is suggested that in claim 76, at line 5, the term "on said semiconductor film" be inserted after "material" so as to point out where the catalyst metal-containing material is formed.

Claim 89 is confusing because the language "reduce a concentration of said metal" at the second-to-last line is subjective and indefinite. The concentration is reduced with respect to what? The same applies to dependent claims 90-100 and 102.

In claim 89, at the second-to-last line, the term "a concentration" should be changed to "the concentration" so as to particularly point out the concentration which is intended. The same applies to dependent claims 90-100 and 102.

In claim 90, at line 3, the term "a silicon oxide" should be changed to "silicon oxide" since "a" is not necessary.

In claim 91, at line 2, the term "a concentration" should be changed to "the concentration" so as to particularly point out the concentration which is intended.

Claim 93, 94 and 95 are indefinite because it is not clear exactly which semiconductor film in claims 86, 87 or 88 is being referred to by the term "said semiconductor film" at line 2 in each of claims 93, 94 and 95. Note that claim 86 refers to both a semiconductor film and an intrinsic semiconductor film, claim 87 refers to both a semiconductor film and a doped semiconductor film, and claim 88 refers to both a semiconductor film and an intrinsic semiconductor film.

Claim 96 and 98 are indefinite because it is not clear which heating in claims 81-88 is being referred to by the term "said heating" at line 2 in each of claims 96 and 98. Note that claims 81-88 recite a heating for the crystallization step and also a heating to getter.

Claim 100 is indefinite because "heating said crystallized semiconductor film" at line 3 lacks positive antecedent support in claim 89.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. Claims 76, 78, 79, and 90-95 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese patent 5-109737, herein referred to as JP '737.

JP '737 prepares a thin film transistor wherein an amorphous silicon semiconductor film (4) is accumulated on insulating substrate (1), and oxide film (5) is formed on the amorphous silicon film (4) (see the attached English abstract and Figure 1 of JP '737). Photoresist film (6) is formed as a mask on the oxide film (5), and then an ion injector injects ions, such as phosphorus, into a section of the amorphous silicon film (4) that corresponds to element non-formation region (3) (see the attached English abstract; pages 2 and 3; and Figure 1 of JP '737). Said section is labeled (7) in Figure 1, is in contact with the amorphous silicon semiconductor film (4), and corresponds to the instant gettering layer. The amorphous silicon layer (4) is crystallized by heating, and, at the same time, the impurities and crystal imperfections are absorbed into the surrounding gettering layer (7) (see attached English abstract; pages 2 and 3; and Figure 1). JP

'737 teaches the limitations of the instant claims other than the difference which is discussed below.

JP '737 does not require that phosphorus be used as the ions in its process. Others are disclosed in the specification. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used phosphorus as the ions in JP '737's process because such is clearly within the scope of JP '737's disclosure.

Double Patenting

14. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.d. 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.d. 937, 214 USPQ 761 (CCA 1982); *In re Vogel*, 422 F.d. 438, 164 USPQ 619 (CCA 1970);and, *In re Thorington*, 418 F.d. 528, 163 USPQ 644 (CCA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

15. Claims 26-76, 78, 79, and 81-102 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-31 of U.S. Patent No. 5,700,333. Although the conflicting claims are not identical, they are not patentably distinct from each other because the method steps recited in the claims render obvious the instant method steps.

16. Claims 26-76, 78, 79, and 81-102 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 39-50 and 64-68 of copending Application No. 08/928,750. Although the conflicting claims are not identical, they are not patentably distinct from each other because the additional processing steps in the claims of said copending application, such as patterning and forming a gate electrode, are not excluded by the comprising language in the instant claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

17. Claims 26-76, 78, 79, and 81-102 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 49-79 of copending Application No. 08/928,740. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of said copending application render obvious the instant claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Arguments

18. Applicant's arguments filed October 25, 1999 have been fully considered but they are not persuasive. With respect to JP '737, applicants argue that the instant claims require providing phosphorus ion after the crystallization step. However, this argument is not deemed to be

persuasive because instant claim 76 and its dependent claims recite "forming a gettering layer in contact with said semiconductor film". In this recitation, the semiconductor film need not be crystallized.

Conclusion

19. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan D. Diamond whose telephone number is (703) 308-0840. The examiner can normally be reached on Monday through Friday from 6:30 a.m. to 3:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached on (703) 308-3322. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3599.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Alan D. Diamond
December 15, 1999

Alan Diamond

ALAN DIAMOND
PRIMARY EXAMINER
~~GROUP 1100~~
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